

Intermediate Algebra, 3/e

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Chapter 12 - Sequences, Series, and the Binomial Theorem

Form A-A

PRACTICE TEST

- For the sequence of even natural numbers 4, 6, 8, 10, ..., find a_{11} , the 11th term.
A) 28 B) 24
C) 30 D) 26
- Eddie has a stack of 4 index cards. With a pair of scissors he cuts the stack in half and then places all the resulting card pieces in a new stack. If he repeats this procedure a total of four times, how many card pieces will he have?
A) 64 B) 20
C) 16 D) 32
- Find the first three terms and the 9th term of the sequence whose general term is $S(n) = \frac{n(n-1)}{3}$.
A) $a_1 = -\frac{1}{3}$, $a_2 = 0$, $a_3 = \frac{2}{3}$, $a_9 = \frac{56}{3}$
B) $a_1 = 0$, $a_2 = \frac{2}{3}$, $a_3 = 2$, $a_9 = 6$
C) $a_1 = -1$, $a_2 = 0$, $a_3 = 2$, $a_9 = 72$
D) $a_1 = 0$, $a_2 = \frac{2}{3}$, $a_3 = 2$, $a_9 = 24$
- Find the sequence that corresponds to the function $a(n) = 2n - 3$, $n = 1, 2, 3, \dots$
A) -1, -2, -3, -4, ... B) -1, 1, 3, 5, ...
C) 1, 3, 5, 7, ... D) 5, 7, 9, 11, ...

PRACTICE TEST

5. A sculpture by a famous artist doubles in value every 50 years. Find the value of the sculpture in the year 1900 if it was worth \$800 in the year 1600.
- A) \$51,200 B) \$4800
C) \$25,600 D) \$28,800
6. For the arithmetic progression 2, 6, 10, ..., find a_6 .
- A) 20 B) 30
C) 26 D) 22
7. For the arithmetic progression 8, 13, 18, 23, ..., find a_n .
- A) $5n - 13$ B) $5n + 13$
C) $5n + 3$ D) $8n - 3$
8. Candy draws a sequence of circles. She starts with a row of 8 circles. The second row has 4 more circles than the first row, the third row has 4 more circles than the second, and so on. Find how many circles she would have in the tenth row.
- A) 44 B) 43
C) 40 D) 48
9. The distance (in feet) that a free-falling body falls in each second, starting with the first second, is given by the arithmetic progression 17, 51, 85, 119, Find the distance that the body falls in the 7th second.
- A) 255 ft B) 187 ft
C) 221 ft D) 238 ft
10. The sum of the first 9 terms of an arithmetic progression is 198 and the ninth term is 42. Find the common difference.
- A) 10 B) 2
C) 5 D) $\frac{14}{3}$

PRACTICE TEST

11. A piece of machinery valued at \$50,000 depreciates \$8000 the first year, \$7800 the second year, \$7600 the third year, and so on. Find the value of this piece of machinery at the end of six years.
- A) \$45,000 B) \$5000
C) \$29,000 D) \$46,800
12. Juan was trying to save his pennies. He saved 12 cents the first week, 18 cents the second week, 24 cents the third week, and so on in arithmetic progression. After a few weeks, Juan had saved a total of \$5.4. For how many weeks had he been saving?
- A) 11 weeks B) 14 weeks
C) 13 weeks D) 12 weeks
13. For the geometric progression $3, \frac{3}{4}, \frac{3}{16}, \dots$, find r .
- A) 4 B) -4
C) $-\frac{1}{4}$ D) $\frac{1}{4}$
14. For the geometric progression 256, 64, 16, 4, ..., find a_n .
- A) 4^{4-n} B) $\left(\frac{1}{4}\right)^{n-5}$
C) $\left(\frac{1}{4}\right)^{4-n}$ D) 4^{n-5}
15. For the geometric progression 4, -12, 36, -108, ..., find S_8 .
- A) -6560 B) 2188
C) 13120 D) 19684

PRACTICE TEST

16. A rubber ball dropped on a hard surface takes a sequence of bounces, each one $\frac{3}{5}$ as high as the preceding one. If this ball is dropped from a height of 10 feet, how far will it have traveled when it hits the surface the fifth time?
- A) $46\frac{14}{125}$ ft B) $23\frac{7}{125}$ ft
- C) $36\frac{14}{125}$ ft D) $43\frac{111}{125}$ ft
17. A certain sum of money is invested in a business. In each year this investment earns $1\frac{1}{2}$ times as much as in the preceding year. If the investment earned a total of \$27,625 in four years, how much did it earn in the fourth year?
- A) \$17,212.5 B) \$25,818.75
- C) \$11,475 D) \$3400
18. Find the sum of the geometric series: $9, -3, , -\frac{1}{3}, \dots$
- A) $7\frac{2}{3}$ B) $6\frac{3}{4}$
- C) $6\frac{2}{3}$ D) $6\frac{13}{18}$
19. Find the sum of the geometric series $(1.008) + (1.008)^2 + (1.008)^3 + \dots$ if the sum exists.
- A) 124 B) 126
- C) 125 D) The sum does not exist.
20. Find the fraction that is equivalent to the repeating decimal $0.854854854\dots$
- A) $\frac{427}{495}$ B) $\frac{427}{450}$
- C) $\frac{854}{999}$ D) $\frac{427}{500}$

PRACTICE TEST

21. A ping-pong ball dropped from a height of 12 feet takes a sequence of bounces, each one $\frac{5}{6}$ as high as the preceding one. If the ball is assumed to continue bouncing indefinitely, find the total distance it would travel.
- A) The distance is infinite. B) 72 ft
- C) 60 ft D) 132 ft
22. Expand: $(a - 2b)^4$
- A) $a^4 + 8a^3b + 24a^2b^2 + 32ab^3 + 16b^4$
- B) $a^4 + 8a^3b + 12a^2b^2 + 8ab^3 + 16b^4$
- C) $a^4 - 8a^3b + 12a^2b^2 - 8ab^3 + 16b^4$
- D) $a^4 - 8a^3b + 24a^2b^2 - 32ab^3 + 16b^4$
23. Find the fourth term in the expansion of $(f - 3y)^6$.
- A) $2025f^2y^4$ B) $360f^4y^2$
- C) $120fy^5$ D) $-540f^3y^3$
24. Nine coins are tossed. In how many ways can exactly 5 tails turn up?
- A) 3024 ways B) 15,120 ways
- C) 126 ways D) 240,240 ways
25. A fair coin is tossed 12 times. Find the probability of getting exactly 7 tails.
- A) 792 B) $\frac{32}{31185}$
- C) $\frac{7}{12}$ D) $\frac{99}{512}$